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Indian Standard

SPECIFICATION FOR TELEVISION PATTERN GENERATORS

PART I REQUIREMENTS

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SPECIFICATION FOR TELEVISION PATTERN GENERATORS

PART I REQUIREMENTS

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Indian Standard

SPECIFICATION FOR TELEVISION PATTERN GENERATORS

PART I REQUIREMENTS

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 17 September 1979, after the draft finalized by the Electronic Measuring Equipment Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 This standard (Part I) specifies requirements for television pattern generators, used in testing, calibration, aligning and servicing of the television receivers.

0.3 Part II of this standard covers methods of measurements.

0.4 Television Pattern Generators have been classified in the following three categories according to the requirements of laboratories and servicing centres:

a) Television pattern generators for TV technicians (Servicing model),
b) Television pattern generators for servicing installations (Installation model), and
c) Television pattern generators for laboratories, manufacturers and TV centres (Professional model).

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) covers requirements of television pattern generators designed to test, calibrate, align and service the television receivers designed for operation in VHF range.

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*Rules for rounding off numerical values (*revised*).

1.2 This standard does not cover television pattern generators required for colour TV.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following terms and definitions shall apply.

2.1 Vision Carrier Frequencies — Frequency on which composite video signal is amplitude modulated.

NOTE — The composite video signal is transmitted in the following channels in VHF range (*see* IS : 4547-1978*):

Band	*Channel*	*Frequency Range*
I	3	54 to 61 MHz
	4	61 to 68 MHz
III	5	174 to 181 MHz
	6	181 to 188 MHz
	7	188 to 195 MHz
	8	195 to 202 MHz
	9	202 to 209 MHz
	10	209 to 216 MHz

2.2 Vision IF — The constant frequency difference between vision carrier and local oscillator of TV receiver irrespective of the band/channel of operation as mentioned in **2.1**. For the television pattern generators this frequency is given as 38·9 MHz.

2.3 Sound IF — The constant frequency difference between sound carrier and local oscillator of the TV receiver irrespective of band/channel of operation is the sound IF frequency. The sound IF is 33·4 MHz. The difference between sound and vision frequency is kept at 5·5 MHz. In television pattern generators the inter-carrier frequency of 5·5 MHz is modulated with an audio signal of 1 kHz for a peak deviation of ± 50 kHz corresponding to 100 percent modulation.

2.4 Composite Video Signal — Signal comprising video signal, line synchronizing and blanking pulses, vertical synchronizing and blanking pulses and serrated vertical pulses.

2.5 Composite Video Signal Amplitude — Signal of peak-to-peak amplitude of at least 1 volt across 75 Ω termination and consisting of 70 percent video signal and 30 percent synchronizing signal.

2.6 Modulation — Amplitude modulated composite video signal on vision carrier, together with frequency modulated audio signal on sound

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*Receivers for monochrome television broadcast transmission (*first revision*).

carrier is included in all TV channels. Percentage negative amplitude modulation in a television pattern generator shall be 60 percent to 90 percent and percentage frequency modulation shall be 30 percent and onwards.

2.7 RF Amplitude — VHF signal amplitude is categorised in two ways; such as TV receiver's maximum signal handling capacity and sensitivity. 60 millivolts and 30 μV shall be the upper and lower rms values. These amplitude values are specified for the 75 Ω termination.

2.8 Balun (Balanced to Unbalanced Unit) — Interface between TV receiver and Television Pattern Generator.

NOTE — This is issued for impedance transformation from 75 Ω to 300 Ω to simulate the antenna of TV receiver.

2.9 Horizontal Sync Pulses — These pulses are 4·7 ± 0·2 microseconds in width and their repetition shall be after each 64 microseconds (frequency — 15625 Hz), and kept from black level to blacker than black level.

3. GENERAL REQUIREMENTS

3.1 The television pattern generators shall be constructed of materials and components most suitable for the purpose of use. The instrument shall be self contained except for standard accessories.

3.2 The components such as resistors, capacitors used in the TV pattern generators shall conform to the relevant Indian standards wherever available.

4. CONSTRUCTIONAL REQUIREMENTS

4.1 The indicating meter if provided should be mounted on the front panel of the TV pattern generator.

4.1.1 The normal position of use of the TV pattern generator shall be either with the front panel in the vertical plane or inclined at 30° to the vertical unless otherwise specified.

4.2 The types of connectors and terminals provided shall be clearly marked. If so required for the correct use of the pattern generator, the terminals shall be clearly marked to the proper method of connection.

4.3 Workmanship and Finish

4.3.1 All parts shall be manufactured and assembled in accordance with the current engineering practice. The pattern generator shall be so assembled as to prevent ingress of dust and other particles.

4.3.2 All exposed metal parts shall be painted or otherwise protected to prevent corrosion under normal conditions of use.

4.4 Controls and Adjustments — The controls and adjustments, if any, shall be provided on the front panel of the pattern generator.

4.5 External Accessories

4.5.1 A Balun and a connecting cable with connectors shall be provided with the pattern generator.

4.5.2 *Carrying Case* — A suitable carrying case, designed to protect fragile parts of the TV pattern generators shall be provided if required by the purchaser. It shall also accommodate all the accessories.

5. SAFETY REQUIREMENTS

5.1 The mains operated TV pattern generators shall conform to the applicable safety requirements of 'Indian Standard Safety requirements for electronic measuring apparatus' (*under preparation*).

6. POWER SUPPLY REQUIREMENTS

6.1 The TV pattern generators shall be designed to operate on power supply as specified below:

Rated voltage	240 V
Operating voltage	
Maximum	250 V
Nominal	240 V
Minimum	200 V

Variation in mains supply frequency (50 Hz) shall be within ± 2 percent.

7. PERFORMANCE REQUIREMENTS

7.1 The performance requirements of TV pattern generators shall be in accordance with Table 1.

8. MARKING

8.1 Each TV pattern generator shall be legibly and indelibly marked with the following information:

a) Model designation (*see* **0.2**) and serial number,
b) Layout plan of the major components,
c) Input supply voltage and (if applicable) frequency,
d) Output terminals with impedance value,
e) Additional markings for safety,

f) Manufacturer's name or trade-mark, and
g) Country of manufacturer.

8.2 The TV pattern generators may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to the standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. INSTRUCTION MANUAL

9.1 An instruction manual containing information relating to installation, operation and maintenance along with circuit diagram and layout of components shall be made available with the TV pattern generator.

TABLE 1 PERFORMANCE REQUIREMENTS

(*Clause* 7·1)

Sl No.	Characteristic	Servicing Model	Installation Model	Professional Model
(1)	(2)	(3)	(4)	(5)
i)	*Ratings*			
a)	RF output voltage* (Into 75 Ω)	High 10 mV ± 10 percent, Low 30 μV	High 10 mV ± 10 percent, Medium 100 μV Low, 30 μV	High 60 mV ± 5 percent, Low 30 μV in six steps of approx 10 dB each
b)	Frequency	IF and at least one channel ± 200 kHz (*see* Note of 2.1)	IF and any one more channels ± 200 kHz (*see* Note of 2.1)	IF and all the channels (*see* Note of 2.1)
c)	Modulation (vision)	AM (negative), 80-85 percent	AM (negative), 80-85 percent	AM (negative), 50-90 percent, continuously variable
ii)	*Performance*			
a)	Vision output voltage	1 V peak to peak, fixed	1 V peak to peak, fixed	1 V to 4 V peak to peak, continuously variable
b)	Sound output voltage* (5·5 MHz modulated)	60 mV across 75 Ω	100 mV across 75 Ω, continuously variable	180 mV arcoss 75 Ω, continuously variable
c)	Intercarrier frequency	5·5 MHz ± 5 kHz	5·5 MHz ± 2 kHz	5·5 MHz ± 1 kHz
d)	Modulation (sound)	FM using internal audio signal of 1 kHz (30 percent)	FM using internal audio signal of 1 kHz (30 percent)	FM using internal audio signal of 1 kHz (30-100 percent, continuously variable)

*The maximum radiation from the TV pattern generator shall be less than the minimum calibrated output available. The radiation shall be measured, using the method specified in IS : 6873 (Part III)-1977 'Methods of measurement of electromagnetic interference : Part III From sound and television receivers'.

(*Continued*)

TABLE 1 PERFORMANCE REQUIREMENTS — *Contd*

SL No.	CHARACTERISTIC	SERVICING MODEL	INSTALLATION MODEL	PROFESSIONAL MODEL
(1)	(2)	(3)	(4)	(5)
iii)	*Features*			
	a) Patterns	1) Cross hatch pattern with maximum settings at aspect ratio of 4 : 3 2) Vertical lines 12 (minimum) 3) Horizontal lines 9 (minimum)	1) Chequer with maximum setting at 4 : 3 aspect ratio 2) 12 Vertical bars (minimum) 3) 9 Horizontal bars (minimum) 4) Cross hatch 5) Dots	1) Chequer variable with maximum setting at 4 : 3 aspect ratio 2) 16 Vertical bars (variable) 3) 12 Horizontal bars (variable) 4) Cross hatch (variable) 5) Dots (variable) 6) All patterns with maximum setting at 4 : 3 aspect ratio 7) Symmetric pattern and constant width pattern facility set by crystal and master oscillator with ± 4 percent variation, mains locked 8) Staircase
		NOTE — An optional pattern to indicate the centre of raster shall be provided, if agreed between the manufacturer and user.		
	b) Line frequency	15·625 kHz ± 1 percent	Set by crystal and master oscillator within ± 0·1 percent. Provision of suitable control to give ± 2 percent variation in order to check receiver locking range shall be made	Set by crystal and master oscillator within ± 0·1 percent. Provision of a suitable control to give ± 2 percent variation in order to check receiver locking range shall be made
	c) Line sync pulses	15·625 kHz ± 1 percent	15·625 kHz ± 0·1 percent	15·625 kHz ± 0·1 percent
iv)	*Accessories*	VHF Balun 75 Ω to 300 Ω	VHF Balun 75 Ω to 300 Ω	VHF Balun 75 Ω to 300 Ω

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ON
ELECTRONIC MEASURING EQUIPMENT

IS:

1885 (Part XLVII)-1977 Electrotechnical vocabulary: Part XLVII Digital electronic equipment

2320-1963 Methods of measurements for amplitude modulated radio frequency signal generator (30 kc/s to 30 Mc/s)

3321-1963 Requirements for general purpose amplitude modulated radio frequency signal generators (30 kc/s to 30 Mc/s)

3437-1972 General requirements for direct reading pointer indicator type electronic voltmeter (*revised*)

3886-1966 Minimum requirements for general purpose audio frequency signal generator (30 c/s to 30 kc/s)

3915-1966 Methods of measurements on audio frequency signal generators (30 c/s to 30 kc/s)

4330-1967 Methods of measurements on cathode-ray oscilloscope (dc to 10 Mc/s)

6700-1972 Requirements for general purpose cathode-ray oscilloscope

6756-1972 Technical documentation to be supplied with electronic measuring equipment

6767 Direct reading point indicator type ac/dc electronic voltmeter:
  6767 (Part I)-1972 Methods of measurement
  6767 (Part II)-1972 Up to 30 MHz
  6767 (Part III)-1972 Up to 300 MHz

6769 (Part I)-1972 Direct reading point indicator type ac electronic millivotmeter: Part I Methods of measurement

6769 (Part II)-1972 Direct reading point indicator type ac electronic millivoltmeter: Part II With a frequency range of 2Hz to 1 MHz

8290-1976 General purpose audio frequency output power meters

8573-1977 Digital electronic dc voltmeters and dc electronic analogue-to-digital converters

9176-1979 Method for specifying the functional performance of electronic measuring equipment

9177-1979 Method for specifying the functional performance of stabilized power supply apparatus

9281 (Part I)-1979 Electronic weighing systems: Part I Terms and definitions
9285 Direct reading pointer indicator type ac electronic RF millivoltmteer
9285 (Part I)-1979 Part I Method of measurements
9285 (Part II)-1979 Part II Up to 1 000 MHz